

Commonwealth of Kentucky
Division for Air Quality
PERMIT STATEMENT OF BASIS

DRAFT

Title V, Construction/Operating

Permit: V-08-031

Kentucky State University

Frankfort, KY 40601

September 15, 2008

Massoud Kayvanjah, Reviewer

SOURCE ID: 21-073-00001

AGENCY INTEREST: 1405

ACTIVITY: APE20080002

SOURCE DESCRIPTION:

A source wide operating Title V (TV) application for Kentucky State University (KSU) was received on July 25, 2008. Additional information was submitted on August 6, 2008 and August 29, 2008. Currently, the source has an operating permit (O-79-444) for the two coal fired boilers (40 and 20 MMBtu/hr). An 18 MMBtu/hr natural gas indirect heat exchanger was constructed in 1989, and other fourteen small once ranging between 1.2 MMBtu/hr and 3.5 MMBtu/hr installed between 1983 and 2008. The insignificant units at the source include thirty five (35) small space heaters, twelve (12) water heaters, four (4) natural gas fired emergency generators, and six (6) diesel emergency generators.

The source is classified as a Title V, due to its having potential emissions of regulated air pollutants, nitrogen oxides (NO_x), sulfur dioxide (SO₂) and carbon monoxide (CO), greater than a major source threshold. This permit contains practically enforceable limit to preclude Section 112(j), of Clean Air Act (CAA). Emissions calculation is based on AP-42 emission factors and units operating hours of 8760 per year, except for the diesel generators whose potential was calculated on 500 hours per year. In addition, KSU is voluntarily taking limit on the hour of operation for the coal boiler to 5000 hours per year, in order to stay below major source the hazardous air pollutant, hydrogen chloride (HCl).

APPLICABLE REGULATIONS:

401 KAR 59:015, Existing indirect heat exchangers, applicable to an emissions unit with a capacity of less than 250 MMBtu/hr, which commenced before April 9, 1972.

401 KAR 60:005, incorporating by reference 40 CFR 60, Subpart Dc, Standards of performance for small industrial-commercial-institutional steam generating units, applies to each steam generating unit commenced after June 8, 1989 that has a maximum design heat input capacity between 10 and 100 MMBtu/hr.

NON-APPLICABLE REGULATIONS:

Clean Air Act Section (CAA) 112(j). Permittee has elected to accept voluntary federally enforceable operating and emission limits to preclude applicability of these standards.

COMMENTS

EMISSION UNITS 01 AND 02

Two Coal Fired Indirect Heat Exchangers -1977

To preclude Section 112 (j) of CAA, the chlorine content of the fuel burned shall not exceed 2956 ppm, by weight, on a monthly average.

Pursuant to 401 KAR 59:015, Section 4(1), particulate emissions from each unit shall not exceed 0.32 lb/MMBtu based on a three-hour average.

Compliance Demonstration Method:

Particulate Emission Rate = [EF] / [coal heating value (MMBtu/ton)] X [1-(MCE/100)]

Where :

EF is the emission factor in lb/ton from current AP 42 1.1-4 until replaced with an approved performance test emission factor

MCE is Cyclone Control Efficiency

Pursuant to 401 KAR 59:015, Section 4(2)(b), visible emissions shall not exceed twenty (20) percent opacity based on a six-minute average except that a maximum of forty (40) percent opacity shall be permissible for not more than six (6) consecutive minutes in any sixty (60) consecutive minutes during cleaning the fire box or blowing soot.

Pursuant to 401 KAR 59:015, Section 4(2)(c), emissions shall not exceed twenty (20) percent opacity based on a six-minute average except during building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations.

Pursuant to 401 KAR 59:015, Section 5(1), sulfur dioxide emissions from each unit shall not exceed 1.13 lb/MMBtu based on a twenty-four hour average.

Compliance Demonstration:

The permittee may assure compliance with the sulfur dioxide standard by calculating sulfur dioxide emissions using the following formula:

$$\text{Sulfur Dioxide Emissions (lb / MMBtu)} = \left[\frac{EF \text{ (lb / ton)} \times S}{\text{Heating value of coal (MMBtu / ton)}} \right]$$

EF = emission factor from AP-42 (currently 38 lbs/ton)

S = percent sulfur content in coal

Pursuant to 401 KAR 50:045, for initial demonstration of compliance with HCl emissions the permittee shall submit a schedule and conduct one performance test within six months from the date of the final permit (V-08-031) using EPA Reference Method 26. The permittee shall conduct another performance test for HCl emissions by the start of the fourth year of this permit to demonstrate compliance with the applicable standard. Emission factors derived from stack testing are to replace the emission factor currently listed in the KYEIS, and shall be used to calculate future emissions.

Pursuant to 401 KAR 50:045, for initial demonstration of compliance with PM emissions the permittee shall submit a schedule and conduct one performance test within six months from the date of the final permit (V-08-031) using EPA Reference Method 5. The permittee shall conduct another performance test for PM emissions by the start of the fourth year of this permit to demonstrate compliance with the applicable standard. Emission factors derived from stack testing are to replace the emission factor currently listed in the KYEIS, and shall be used to calculate future emissions

Pursuant to 401 KAR 50:045, when the unit is in operation, the permittee shall read, weather permitting, the visible emissions using U.S. EPA Reference Method 9 once per week, or more frequently if requested by the Division.

Pursuant to 401 KAR 52:020, Section 26, the permittee shall monitor and maintain records of operations for sulfur dioxide and hydrogen chloride emissions shall be conducted by representative (batch delivered) sampling and analysis of fuel.

Pursuant to 401 KAR 52:020, Section 26, the permittee shall monitor and maintain records of the rate of fuel combustion shall be recorded at least monthly. The heating value and ash content of fuels shall be ascertained per delivered shipment.

EMISSION UNIT 03 ***Natural Gas Fired Unit*** ***1989***

Pursuant to 401 KAR 59:015, Section 4(1)(c), particulate emissions from the unit's stack shall not exceed 0.34 lb/MMBtu, based on a three-hour-average.

Pursuant to 401 KAR 59:015, Section 4(2)(b), opacity emissions from the indirect heat exchanger shall not exceed twenty (20) percent except that a maximum of forty (40) percent opacity shall be permissible for not more than six consecutive minutes in any sixty consecutive minutes during cleaning the fire box or blowing soot.

Pursuant to 401 KAR 59:015, Section 4(2)(c), emissions from the indirect heat exchanger shall not exceed 20 percent opacity based on a six minute average except during building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations.

Pursuant to 401 KAR 59:015, Section 5, sulfur dioxide emissions from the unit's stack shall not exceed 1.20 lb/MMBtu

Pursuant to 401 KAR 52:020, Section 26, the permittee shall monitor and maintain record for the hours of operation and the natural gas usage on a monthly basis.

Pursuant to 401 KAR 50:045, the permittee shall demonstrate initial compliance for the unit in accordance with the requirement of Section G.4 of the final permit (V-08-031)

Pursuant to 401 KAR 52:020, Section 26, the permittee shall perform a qualitative visual observation of the opacity of emissions from the stack on a weekly basis and maintain a log of observations. If visible emissions are seen then the opacity shall be determined by using U.S. EPA Reference Method 9. If emissions are in excess of the applicable opacity limit, then an inspection shall be initiated of control equipment for any necessary repairs.

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<u>EMISSION UNIT 04</u>	<i>14 Natural Gas Fired Units</i>	<i>1983-2008</i>
Shauntee Hall	(EP 01)--1.7 MMBtu/hr	1983
Aquaculture Hatchery	(EP 02)--1.2 MMBtu/hr	1983
The Halls (Old Young Hall)	(EP 03)--Two (2) 2.4 MMBtu/hr each	1993
	(EP 04)--Two (2) 2.0 MMBtu/hr each	2006
Atwood Research Center	(EP 05)--2.5 MMBtu/hr	1994
Underwood Cafeteria	(EP 06)--Two 3.5 (2) MMBtu/hr each	2002
Whitney Young Hall	(EP 07)--Five (5) 1.5 MMBtu/hr each	2008

Pursuant to 401 KAR 59:015 Section 4(1)(b), particulate emissions from each unit's stack shall not exceed 0.32 lb/MMBtu, based on a three hour average.

Pursuant to 401 KAR 59:015 Section 4(2), visible emissions from each unit's stack shall not exceed 20 percent opacity based on a six-minute average, except a maximum of forty (40) percent opacity shall be permissible for not more than six (6) consecutive minutes in any sixty (60) consecutive minute during cleaning of the firebox or blowing soot.

Pursuant to 401 KAR 59:015, Section 4(2)(c), emissions from each unit shall not exceed 20 percent opacity based on a six minute average except during building a new fire for the period required to bring the boiler up to operating conditions provided the method used is that recommended by the manufacturer and the time does not exceed the manufacturer's recommendations.

Pursuant to 401 KAR 59:015 Section 5(1)(b), sulfur dioxide emissions from each unit's stack shall not exceed 1.06 lb/MMBtu, based on a three hour average.

Pursuant to 401 KAR 50:045, the permittee shall demonstrate initial compliance for EP 07, in accordance with the requirements of Section G.4 of the final (V-08-031)

Pursuant to 401 KAR 52:020, Section 26, the permittee shall monitor and maintain record for the hours of operation and the natural gas usage on a monthly basis.

<u>EMISSION UNIT 05</u>	<i>Ten (10) Diesel and Natural Gas Fired Emergency Generators</i>		
<i>Six (6) - diesel units</i>		Capacity	Year Constructed
EP08-Hill Student Center	Kohler	285 KWH	2001
EP09-Jordan	Kato	520 KWH	1979
EP10-Jordan	Kohler	100 KWH	1975
EP11-Research Farm	Mil surplus	100 KWH	2007
EP12-Hathaway Hall	Cummins	125 KWH	2008
EP13-Whitney Young	Generac	100 KWH	2008
<i>Four (4)- natural gas units:</i>			
EP14-The Halls (Old Young)	Centurion	15 KWH	2006
EP15-Aquaculture Hatchery	Kohler	70 KWH	1983
EP16-Aquaculture Nutn. Lab	Kohler	10 KWH	1983
EP17-Exum Center	Kohler	70 KWH	1992

Pursuant to 401 KAR 52:020, Section 26, the permittee shall monitor and maintain records of fuel used and the total hours of operation of each generator on a monthly basis and on a consecutive twelve (12) month total.

EMISSION AND OPERATING CAPS DESCRIPTION:

To preclude Section 112(j) of the Clean Air Act, source-wide emissions of a single hazardous air pollutant (HAP), shall not exceed 9.0 tons any consecutive twelve-month period.

CREDIBLE EVIDENCE:

This permit contains provisions which require that specific test methods, monitoring or recordkeeping be used as a demonstration of compliance with permit limits. On February 24, 1997, the U.S. EPA promulgated revisions to the following federal regulations: 40 CFR Part 51, Sec. 51.212; 40 CFR Part 52, Sec. 52.12; 40 CFR Part 52, Sec. 52.30; 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12, that allow the use of credible evidence to establish compliance with applicable requirements. At the issuance of this permit, Kentucky has only adopted the provisions of 40 CFR Part 60, Sec. 60.11 and 40 CFR Part 61, Sec. 61.12 into its air quality regulations.